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A Slow Fuse Burns in Morocco

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Rivers of the World: The Yangtze

Walls Enclose a Storied Moroccan Street—In Fès, holy city of the Moslems, burnoose, veil, fez, and turban meet Western dress in shop-lined thoroughfares. A thousand palaces and countless mosques, but not a single European building, rise in this city of 180,000. An old water clock appears at upper left, resembling a balcony.

(SEE PAGE 74)

JEAN AND FRANC SHOR, NATIONAL GEOGRAPHIC STAFF

In little shops and stalls craftsmen tool superb Moroccan leather tanned in reeking vats, or work silver or intricate mosaic patterns. In Marrakech's crowded Djema el Fna mingle dentists, rug and candy merchants, performers, letter writers. "Doctors" sell "infallible remedies" made from dried lizards, snakes, and animal bones.

Ragged water vendors shuffle by with filled goatskins. Storytellers spellbind circles of listeners with age-old tales. Skull cap and black gaberdine indicate a Jewish trader, one of 200,000 of his faith living in Morocco. A madman is venerated and given alms, for "his mind is with Allah."

All over this California-size land you will sense a timeless past. But the present, too, makes itself felt with the surge of nationalism and attendant terrorism. World War II brought complete independence to Syria, Lebanon, and Libya, lighting a slow fuse in Morocco. French grant of home rule in Tunisia intensified Moroccan desire for freedom.

The French came in violence 50 years ago and brought peace to Morocco. "Before, we were always fighting and raiding, tribe against tribe," reminisced an old Berber warrior. "Now my family no longer fears. Our house once had loopholes for shooting. Now I can have windows."

Frenchman and Moroccan together honor Marshal Lyautey, who pacified the country and launched its modernization. As railroads and highways funneled the country's rich phosphates, iron, manganese, and agri-

Donkeys Pause to Reflect in a Moroccan Stream—A dusty trail leads among palms to the kasbahs of Ouarzazate, crossroads town across the Grand Atlas from Marrakech.

J. BELIN

A Slow Fuse Burns in Morocco

Morocco! Slender minarets, narrow winding alleys, veiled women, and white-robed men come to mind. We see throbbing market places, snake charmers, an Arabian Nights fantasy. Crenelated forts sit foursquare amid burning Sahara sands, right out of the pages of *Beau Geste*. Spirited Riffs resist French Legionnaires.

Are these images real or did the movies prompt them? Whatever our conception of this northwest African land, real-life French Morocco has surprises in store.

Veils and Swim Suits—Arriving at Casablanca airport, we taxi to a glittering modern metropolis where swank shops, cafés, and luxurious hotels flank palm-lined boulevards. Not camels but bicycles compete with automobiles in noon-hour traffic, and up-to-date factories hum in the city's outskirts. Our eyes pick out a Moorish miss in flowing robe and veil only to see her later emerge clad in brief bathing suit to sport in the world's largest municipal pool.

Vapor trails of Morocco-based U. S. jet planes lace the sky as we speed along fine modern highways. We look in vain here for burning desert. The countryside reminds us of California. Plows turn the dark and fertile soil, and expanses of golden grain splashed blue with flax blossoms and green with vegetables checkerboard the gently rolling plain. We pass thriving vineyards and orchards yielding oranges, olives, almonds, figs, and pomegranates.

Chickens scurry around conical huts of the peasants, contrasting to the square mud-walled *ksars* and *kasbahs* of the town dwellers. Arab women and their blue-tattooed Berber sisters grind grain in stone mills to go with lamb into *kous-kous*, the staple Moroccan diet.

Tree-climbing Goats—Cattle and sheep by the thousands graze ranges that at times are a sea of flowers. Black tents house Berber nomads. In certain areas we are startled to see goats perched aloft nibbling fruit from twisted limbs of the argan tree.

Soaring to more than 13,000 feet are the Atlas Mountains, whose three ranges slice across the country from northeast to southwest. Adding to our surprise at snowcapped peaks are high mountain meadows like Switzerland's, and forests of cedar, pine, and cork on northern slopes. Crossing the barrier to where maps say Sahara we still must look for seas of sand, for much of the desert is caked earth littered with stone and clumps of hardy vegetation.

In walled cities like Fès, Meknès, Marrakech, and the administrative capital of Rabat we find massive gateways, resplendent palaces, and mosques that spell old Morocco. Red and crumbling pink dwellings turn mud backs on narrow streets to concentrate on the life inside. In chairless, often windowless rooms one relaxes on rug or hassock while partaking of lamb, roast chicken, piquant sauces, and mint tea served on a low table.

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Strange Friendships in the Animal World

It seems a turnabout world when sheep dogs push lions around and cats and rats eat from the same dish. But actually the realm of fang, beak, and claw is often a sociable one.

We've all heard of dogs nursing young pigs, or bear or lion cubs. But in the Sydney, Australia, zoo a sheep dog exercised so much "parental influence" that when the lion grew big they had to be separated. Visitors complained that the dog bullied the lion.

A Tulane psychologist recently proved "that cats and rats, the so-called natural enemies, can and do cooperate." He put a cat with "a long and glorious record of rat-killing" together with a rat in a special cage. On the other side of a partition was a dish of food. To get at the food the two animals had to step simultaneously on separate floor buttons. This automatically removed the partition. After about 550 trials cat and rat learned the trick. From then on they easily pushbuttoned the partition away and the once ferocious cat and his time-honored "victim" peacefully ate face to face out of the same dish.

From Grand Rapids, Michigan, a museum reports that a weasel, regularly given mice as food, recently refused to eat his dinner. He had made friends with the little white mouse and didn't want to eat him. The new-found animal friends later shared horse meat given the weasel as a between-mouse snack.

In the wilds, antelopes and ostriches have been observed living in harmony with baboons. House cats sometimes forget their taste for feathers and consort in peace with parakeets and cage birds.

A Dutch airline has found that elephants being flown to circuses and zoos become nervous in the air—unless hens are perched on their heads. These flapping, cackling companions soothe the mammoth passengers.

The children of this bulletin's writer once had an Easter duckling. They also had a dog and kitten. All three played and ate together. When tired the dog would flop down, the kitten curl alongside, and the duck lie across both while all dozed happily.

W. O. SCHILLING

References—See under *Birds* and the names of various animals in the *National Geographic Magazine Cumulative Index*.

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cultural produce through its port, Casablanca rose from a mud-hovel village to Africa's fourth city, with nearly 700,000 people.

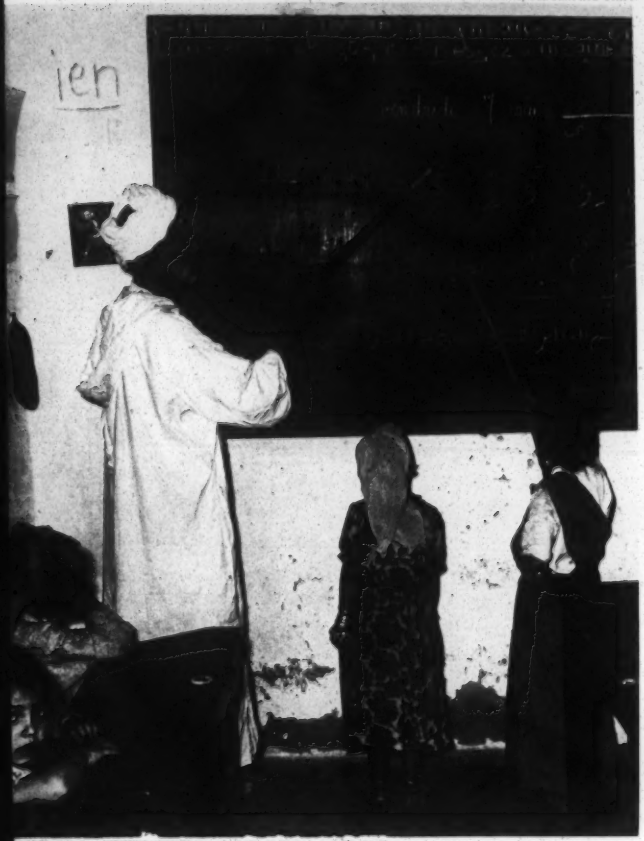
French doctors and nurses selflessly fight disease in outlying districts. French experts work to improve animal breeds and crop yields and to stamp out pests that ruin cattle and harvest. But ask a leader of *Istiqlal* (Independence Party) and he will tell you that Morocco's material gains have mainly benefitted the *colons* (French settlers) who control the protectorate's economy. And what political rights have Moroccans when the French can and recently did depose a sultan?

"More than 8,000,000 Moslems and only 360,000 Frenchmen live here," he says, "yet our people cannot even get jobs as mailmen and railroad switchmen. All French children in Morocco go to school, and only seven percent of the Moslem children. The French tell us we haven't the experienced technicians and administrators necessary to run a modern state, but won't help us train them."

The colon's reaction? "I made this land what it is," says one. "I have no intention of leaving—ever." Another shrugs and says, "But monsieur, there has always been trouble with the Arabs. It is *une condition normale*, like the hot wind from the desert."

But as the fuse burns shorter, moderate Moroccans conclude: "We need France, and France needs us. We only ask to live our lives as they live theirs. It will come about, *Insha'Allah*—if Allah wills."

JEAN AND FRANC SHOR, NATIONAL GEOGRAPHIC STAFF



References—Morocco appears on the National Geographic Society's map of Africa. Write the Society, Washington 6, D. C., for a price list of maps. See "Americans on the Barbary Coast," *National Geographic Magazine*, July, 1943; "Eastward from Gibraltar," Jan., 1943; "Fez, Heart of Morocco," June, 1935; "Beyond the Grand Atlas," March, 1932; GEOGRAPHIC SCHOOL BULLETINS, Mar. 12, 1951, "Morocco Becomes 'Gibraltar of the Air'". *School and Library discount price for Magazine issues a year old or less, 50¢; through 1946, 65¢. Send for prices of earlier issues.*

Schooldays in Tiznit—A burnoosed elder teaches Arabic letters. His students are among the few Moslem girls receiving education in Morocco. Lack of school-trained personnel has encouraged France to retain protective control of Morocco; the country's manifold problems have kept education from all but a scattering of the people.

A two-month-long daylight period during midsummer is balanced by unbroken darkness for an equal period in wintertime.

Of the 34,000 Lapps who lead nomadic lives in Scandinavia's northern reaches, those of Finland are least changed from the ways of their ancestors.

Few Lapps are left in Russia, most are in Norway, many in Sweden. "North with Finland's Lapps" in *The National Geographic Magazine* for August, 1954, gives a complete, color-illustrated account of this distinctive people.

JEAN AND FRANC SHOR, NATIONAL GEOGRAPHIC STAFF; BOTTOM, WERNER BISCHOF, MAGNUM

VICTOR LEON

Reindeer-Tending Lapps Seek Greener Pastures

Seasonally, when home fields and forests have been grazed low, the Lapps set forth with their herds for new pasturelands north of the Arctic Circle. Over soggy tundra the caravan treks, often traveling 100 miles or more. Father carries the youngest child, reindeer serve as pack animals, and dogs trail along.

Arrived at their new location, daughter climbs a rail fence to watch father and mother erect their temporary tepeelike home of skin-covered branches. Grandmother sets to work making thread. She takes an end of reindeer sinew between her teeth (below) and deftly strips it into fibers with which to sole the family's bootlike *mutukas*.

The reindeer supplies almost every need. It clothes the Lapp from his four-cornered "hat of the four winds" to his mutukas. The pelt becomes a winter coat, the skin makes snug leggings. Spoons are carved from the horns, knife handles from bones.

Last but not least the reindeer gives milk (below) and its meat appears for three daily meals the year round. Winter lasts a bitter nine months; the reindeer's gifts of food and clothing allow the Lapps to continue living so far north.

Most permanent homes are of hand-hewn logs. When the household fares forth in search of greener pastures, the family camps near woodlands from which to make fencing, fire, and tepee framework. Because of extreme cold, woods are stunted, as indeed are Lapps themselves, the average height being about five feet.

A two-month-long daylight period during midsummer is balanced by unbroken darkness for an

The Yangtze: Life and Death in China

To Wang Sing, riverman, and to millions of his brothers, the Yangtze is "*the* River." It is his life and perhaps will be his death.

Wang knows the moods of the 3,100-mile stream only too well. Born in Hankow, he came of age during the great flood of 1931 when he lost his father, a boatman before him, while ferrying a load of kerosene to Chungking. The raging current tore the bamboo towrope from the hands of trackers on the rocky towpath. Running uncontrollably through the gorges above Ichang, the bobbing craft struck a rock and capsized. Wang, 15 years old, saved himself by clinging to an inflated sheepskin.

Chinese families look out for their own. An uncle took Wang in. Eventually he became master of his own junk, a larger vessel than his father's. As he grew older he ranged up and down the Yangtze from Shanghai, near its mouth, to mountain-ringed Ipin, 1,850 river miles inland. Now, from Ipin, he looks west where far away the river rises in the cold mists of Asia's roof. He regrets that the rowdy, youthful force of water prevents boats from ascending to clouded Tibetan borderlands. He wants to see skyline farms where families till tiny terraces thousands of

Shanghai, Gateway to the Yangtze—Soochow Creek, running through the teeming metropolis, is home to thousands who live and die on the water. Here, after a week of rain, boat women air clothing in the China sun, while men unload farm produce.

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

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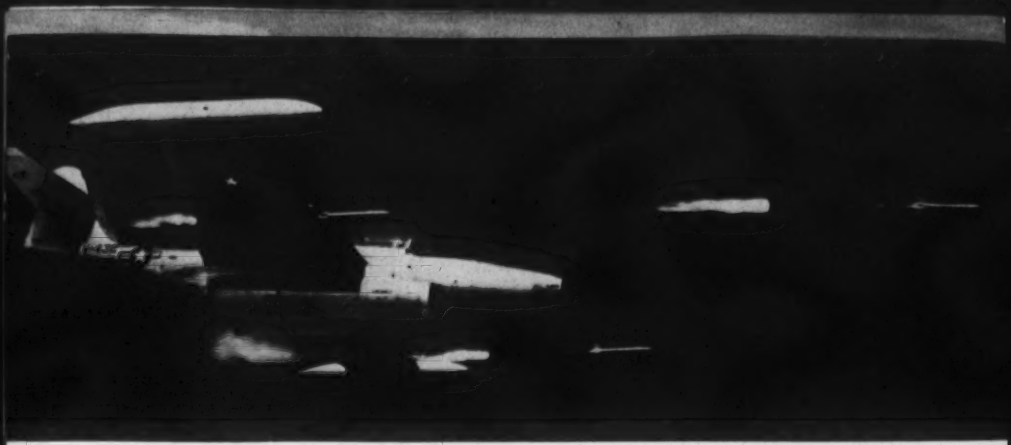

NORTHROP AIRCRAFT, INC.

Titanium, Wonder Metal of the Jet Age

If you had bought a pound of titanium seven short years ago it would have cost you $3,000. Today you'd pay $12 to $18.

Each new type of jet plane contains more of this silver-gray metal. Specifications for two 1958-model jet engines call for 80 percent titanium. Why? Six times stronger than aluminum, less than half the weight of steel, this wonder metal is an aircraft designer's dream.

Chop a pound off engine weight and you can reduce frame weight six to ten pounds. Less wing is required to lift the engine. This means extra load capacity, greater range, speed, and maneuverability. Small wonder the Air Force wants all the titanium it can get!

Titanium production climbed from three tons in 1948 to 500 in 1951; 1953 upped the figure to 2,241. Still the nation's defense needs run 30 times ahead of 1954's expected 5,000 tons. Titanium makes ideal gun and guided-missile parts, lightweight tank armor, portable bridges. The Navy finds corrosion-resistant titanium invaluable for submarine snorkel tubes. The Atomic Energy Commission puts it to secret uses.

Industry wants to set titanium to work in oil refineries, chemical plants, textile mills, and elsewhere. Doctors use it to replace or reinforce bones in the human body. But only ten percent of titanium output is currently earmarked for civilian use.

Titanium is more abundant in the earth's crust than any other structural metal except aluminum, iron, and magnesium. Why then is it in such short supply, and so expensive?

Blame titanium's chemical activity and 3,140°F. melting point.

In 1789, an English clergyman-mineralogist found the element in the black beach sands of Cornwall. A German chemist later rediscovered it in another form and named it for the Titans of Greek mythology.

Many scientists struggled with the challenging metal, but more than a century passed before it could be isolated in pure state. Meanwhile, titanium oxides won a place as a pigment to whiten paints, face powder, leather, paper, fabrics, linoleum, and as a coating for welding rods. Titanium alloys strengthen other metals.

In 1940 Wilhelm Kroll, a German refugee, devised a practical method of transforming the balky element into adaptable bars, sheets, wire, and foil. Eight years later titanium was on its way.

a couple of small-bowled, long-stemmed pipes as the evening wears on.

The farther downstream Wang goes, the more people he sees. He passes areas where more than 2,500 farm people crowd each square mile. One tenth of the world's people live within the basin which is his beat.

His keen eyes study the dikes along many miles of riverbank. Usually they rise 10 to 15 feet, but in places reach 25 feet. Looking across rice paddies he sees more water than land. He secretly laughs at the farmers' attempts to control the water. They build rock sausages—long bamboo bags filled with rocks—and lay them along dikes and levees for added strength. He knows all one can do when the river god is angry is to burn incense at sunrise and sunset.

Approaching Nanking he remembers how it had been his country's capital. He was near by when Japanese planes bombed and sank the United States gunboat *Panay* on the Yangtze late in 1937. He seldom concerns himself with such matters but realizes that a period of warfare which began at that time had kept the basin in turmoil, and shut off from the world.

In Shanghai especially he notices a difference. Always the great teeming port had frightened him and made him feel like a country bumpkin. But the busy Bund with its buildings scraping the sky, with its foreigners hurrying about in linen suits, had made him proud that to his river came all the nations of the world to do business. In narrow Hwang Pu, a tidal inlet connecting Shanghai with the Yangtze mouth, docked great ships. Every year 38,000,000 tons of shipping entered or cleared the port, two thirds of it in the iron hulls of the foreigners.

But on his last trip Wang has plenty of room to maneuver his boat. He is saddened to see so many empty berths and vacant midstream anchorages. The harbor is almost quiet, except for the usual swarm of junks and riverboats. He takes on a load of flour distributed by a flood-relief organization and heads upstream.

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

Junk at Wind Box Gorge—Oarsmen lean against their sweeps and patched sail catches the breeze as one more of Yangtze's gorges is left behind on an upstream voyage.

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feet above the eddies and whirlpools.

But the down-river gorges offer challenge enough. Wang knows the odds: one junk in 10 making the passage is badly damaged; one in 20 is completely wrecked. Lunging past Wind Box Gorge, he remembers the legend of Yu-wang, god of rivers. Sitting on the mountain above, the god decreed the course the water should take. But the rocky crags stubbornly resisted. The wizard Wu-tze, in a helpful mood, loosed a powerful blast of wind from his nostrils and opened a channel through the mountains. If one doubts the story, there is Wind Box Gorge to prove it!

Once through the gorges the mad river matures, slows its pace, and spreads into lakes. Wang enjoys the easy miles in the open country, watching farmers and their families planting the good earth, using hand tools to wrest a living in rice, corn, beans, barley, and wheat from garden-size plots. The Yangtze divides China's southern rice bowl from wheat and millet lands to the north.

On each trip Wang searches out the steamers when he reaches Hankow. This is as far upstream as the larger ones come—700 miles from Shanghai. Occasionally he sees 10,000 tonners in summer during high stage. He ties his junk at the edge of the forest of sampans and houseboats and goes ashore by jumping from deck to deck. Like himself, the people whose "front yards" he crosses are born, live, and die on the river, seldom touching land.

Home in Hankow, Wang dodges among rickshas to a wall showing the highwater mark of 1931. Bowing, he venerates his father and other ancestors lost to the river. Visiting with friends, he nibbles bits of ginger and watermelon seeds, then shares steaming bowls of rice and portions of fish. Chopsticks put away, they play cards and dominoes and enjoy

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

Lucky Steamer Passengers Watch Junks Beat Against Yangtze Currents. Unseen Trackers on the Faint Towpath above the First Sail Help by Towing: West of Ichang

Through invasion, occupation, civil war, communist overlordship, the Yangtze flows on untroubled by man's problems. As in valleys everywhere, "what happens to . . . the water determines what happens to the people." Annual floods come, the ponderous burden of silt pours into East China Sea, soil collects fast enough to push the shore line out another mile every 70 years, and the stain of wasted soil reaches far beyond the sight of land.

Though three of the world's rivers are longer, none touches more lives. In its basin—four fifths the size of the United States east of the Mississippi —live as many people as in all North America. The Yangtze is their highway, their giver of life and dealer of death.

And where is Wang Sing now? In August of this year his river god gave vent to a wrath far worse than the 1931 fury. Swelled by melting snows and lowland rains, the Yangtze rose to a flood crest of 97½ feet at Hankow. The waters overspread an area almost as large as Indiana. Early rice crops were destroyed, other crops drowned beyond saving. The flood receded so slowly that late crops could not be planted. Famine, pestilence, disease followed on the sodden heels of lowering waters.

Wang was nearing Hankow when the rapid current swung a huge log raft out of control. With relentless force it crushed his frail vessel. News of individuals does not penetrate the bamboo curtain the communist masters have raised between China and the free world. So, who knows? Perhaps Wang Sing has joined his venerable ancestors.

References—The Yangtze River is shown on the Society's map of China.

See "Along the Yangtze, Main Street of China," *National Geographic Magazine*, March, 1948; "Today on the China Coast," Feb., 1945; "Through the Great River Trenches of Asia," Aug., 1926 (out of print; refer to your library).